sidered as contributions to a scientific inquiry into the climate of these islands.

The Council of the Scottish Meteorological Society, in a report dated 3rd July, 1872, drew attention to the positions of the thermometers, particularly those at Aberdeen which are forty-one feet above the ground and surrounded with buildings; giving it as their opinion that "observations so made were not comparable with each other, nor with other observations."[*] The publication since, by the Committee, of the hourly readings, enables us to examine the point from the observations themselves. One of the best marked phases of the daily temperature, as well as one of the most important, both for scientific and practical purposes, is the increase which takes place from 9 A.M. to 3 P.M. At Kew the mean increase between these two hours for January and February 1874 was 4°·8, and for June and July 6°·7—the greater increase in the summer months being in accordance with the climatic facts. But at Aberdeen the thermometers indicated between the same hours a mean increase of 3°·7 for January and February, and 1°·8 for June and July; thus, instead of being larger in summer, the recorded difference was only half that recorded in winter. It is needless to remark that these results for Aberdeen cannot represent the temperature of this part of her Majesty's dominions, and that for the supplying of data for temperature "constants" for that part of North Britain, the observations made there are worse than useless. The arrangements for the thermometers at the seven Observatories, both as regards height above the ground, and exposure, call for reorganisation.

In Part I. of the Quarterly Weather Report for 1870 (App. pp. 8–10) appears a valuable Table of the mean monthly readings of the barometer at the Committee's telegraphic stations. If we were sure that the method of annual inspection of these stations is a sound one, the results for Holyhead might suggest an inquiry into the influence of the sea on the state of the barometer. The position of the rain-gauges above the ground at these stations, which varies from five inches to 23 feet (Q. W. Report for 1873, Part III., p. 44), calls also for revision.

In all the Reports issued by the Office it will be observed that no monthly mean temperatures for the telegraphic stations have yet been published by the Committee. With reference to these stations, Mr. Symons, in December 1869, remarked: "Various facts brought under our notice convince us that more remains to be done than has yet been effected, and that in many respects these stations [telegraphic] are unworthy of the nation of which they are to a certain extent representative."[†] We have no means of knowing how far matters have been rectified. It may therefore be doubted, if the Office were asked to furnish meteorological information for the use of the Registrar-General, whether they possess in their own stations the means of supplying it.

We deeply regret the position we have been forced to assume in reviewing the work of the Meteorological Office, but our duty as public journalists leaves us no choice in drawing attention to the work done in return for the annual grant by Parliament of 10,000*l*.

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[*] Journal Scot. Met. Soc., vol. iii. p. 290.

[†] *Meteorological Magazine*, vol. iv. p. 177.

ARCTIC GEOGRAPHY AND ETHNOLOGY

A Selection of Papers on Arctic Geography and Ethnology, reprinted and presented to the Arctic Expedition of 1875, *by the President, Council, and Fellows of the Royal Geographical Society.* (London: John Murray, 1875.)

WHILE in absolute value the Admiralty Arctic Manual must be regarded as considerably superior to the one before us, still the latter contains a great deal of matter interesting in itself and of high value as adding to our knowledge of the Arctic regions. The Geographical Society deserves thanks for the present it has made to the Arctic Expedition, and we have no doubt that the explorers will find the Selection of real service in enabling them to add to our knowledge in the directions pointed out therein. The editing of the work has been well done by Mr. Clements R. Markham.

The papers in the Geographical Society's "Collection" are arranged under the two main divisions of Geography and Ethnology, although under the former there is much that might be more properly classed under the head of Geology. The first series of papers in the geographical section, occupying about one-half of the space allotted to that section, and about one-fourth of the entire volume, is by Dr. Robert Brown. These papers consist mostly of reprints and condensations of papers by Dr. Brown, which have already appeared in various scientific publications. It seems to us that the value of these papers would have been much enhanced had the author carried condensation much further than he has done. Dr. Brown's style is often painfully slipshod; he frequently indulges in a great waste of words with inadequate result, and it would only have been courteous to those for whose behoof this compilation was made to have revised his papers most thoroughly, stating all the facts as briefly and clearly as possible.

It is unnecessary to enter here in detail into the subjects treated of by Dr. Brown, especially as most of the geological facts have recently been given in NATURE in the series of papers by Mr. De Rance (vol. xi. p. 447, *et seq.*) After describing all that is at present known of the Greenland coast-line, both east and west, Dr. Brown gives a brief account of the few journeys that have been attempted into the interior of Greenland. The country has never hitherto been crossed; if judiciously gone about the feat might very possibly be accomplished. He believes Greenland to be "only a circlet of islands separated from one another by deep fjords or straits, and bound together on the landward side by the great ice-covering which overlies the whole interior, and which is pouring its outflow into the sea in the shape of glaciers and icebergs." The general opinion undoubtedly is, as one of the greatest glacial authorities, Mr. James Geikie, puts it, that "the whole interior of the country would appear to be buried underneath a great depth of snow and ice, which levels up the valleys and sweeps over the hills," though Dr. Brown believes there are no mountains of any extent in the interior. The statement of Dr. Rink, in his paper, reprinted here, "On the Discoveries of Dr. E. K. Kane," seems to us, however, to be more philosophical. "The reality is," Dr. Rink says, "that wherever one attempts to proceed up the fjords of Greenland, the interior appears covered with ice; but there is no reason whatever to assume that this applies to the central part of the country, in which one, on the contrary, just as well may assume that there are high mountain chains, which protrude partly from the ice." Dr. Rink, moreover, thinks the "ice-fjords point out probably the rivers of the original land, now buried under ice." At present any statements with regard to the interior condition of Greenland must be at best conjectural, though all we know seems to point to its being one sheet of glacial ice, the main flow of the glacier being to the west rather than to the east.

The remainder of the geographical section is occupied by some very valuable papers which the Society have done well to reprint and put in the hands of the members of the Expedition. The paper "On the best means of reaching the Pole," by Admiral Baron von Wrangell, is interesting as being the first proposal to attempt to reach the Pole by the route of Smith's Sound. The paper, moreover, gives some valuable hints as to the method which ought to be adopted in attempting an exploration by this route, and coming as they do from one who has had so great experience in Arctic exploration, they ought to be received with great respect. The paper by Dr. Rink, who may safely be entitled "one of the most eminent living authorities" on many scientific subjects connected with Greenland, on the discoveries of Dr. Kane, we have already alluded to. While admitting the valuable contributions made by Dr. Kane to our knowledge of the geography of the Smith Sound route, Dr. Rink justly criticises the scientific theories broached by Dr. Kane as to the interior of Greenland, the "open Polar Sea," the connection between the Greenland and American coasts, and other points. Dr. Kane's theories are shown to have been based on very insufficient data, and subsequent exploration has only served to prove the justness of Dr. Rink's criticisms.

One of the most careful papers in this section is by Admiral E. Irminger, of the Danish Navy, on "The Arctic Current around Greenland." This paper is based on a thorough examination of the log-books of a large number of Danish ships sailing between Greenland and Denmark. The now generally accepted conclusion he reaches is that the current from the ocean around Spitzbergen, which carries so considerable masses of ice, after it has passed along the east coast of Greenland, turns westward and northward around Cape Farewell, *without detaching any branch* to the south-westward, directly towards the banks of Newfoundland. The current afterwards runs northward along the S.W. coast of Greenland, until about lat. 64° N., and at times even as far up as 67°. Afterwards turning westwards, it unites with the current coming from Baffin's and Hudson's Bays, running to the southward on the western side of Davis Strait, along the coast of Labrador, thus increasing the enormous quantity of ice that is poured into the Atlantic Ocean.

The concluding series of papersin the geographical section is by Admiral Collinson. "The full results of that distinguished officer's remarkable Arctic voyage," to quote the words of the preface, "have never been given to the public; and both the Fellows of the Society and the officers of the Arctic Expedition are to be congratulated on having elicited so valuable an instalment. Admiral Collinson gives his notes on the state of the ice, and on indications of open water, from the mouth of the Siberian river Kolyma, along the shores of Arctic America, to Bellot Strait. He also furnishes a narrative of all the expeditions that have explored the shores of Arctic America, from Point Barrow to the Mackenzie River, and from the Mackenzie to the Back River, including his own voyage, and concludes with some general observations on the ice." The contribution made by Admiral Collinson is really an elaborate one, and must have cost its author much trouble. It affords insight into a variety of points connected with Arctic navigation, but more especially on the tides, the nature of the ice, the set and rate of the currents in Behring Strait, and to the east and west of that along the coasts of America and Asia.

> "On the Asiatic side we have indisputable records of open water continuously met with during the period of lowest temperature for a distance of upwards of 1,000 miles. On the opposite shore the ice is driven frequently during the winter by the force of the wind from the coast at Point Barrow, but along the American continent to the eastward the ice, as far as we are capable of judging from one winter's experience, it remains quiet and immovable. Hence comes the question, Does the effect of the Pacific current lose itself in the expanse of the Polar Sea, or does it take an easterly trend? So far as experience guides us, the positions reached by the *Enterprise* in 1850 prove the existence of a loose pack 100 miles to the north-east of Point Barrow; beyond this, until we come to the records given by Sir R. M'Clure, nothing is known, but we have undoubted testimony that the pressure on the north face of Banks Land comes from the westward: and here in this strait, between Melville Island and Banks Land, occurs one of those dead locks in the motion of the ice that are remarkably instructive. . . . . So far as can be gathered from the accounts given, it may, I think, be assumed that the pack is looser, and open spaces of water are more frequent to the north than they are to the south of the Parry Group. . . . Though the Pacific current is in a great measure turned aside from the face of the American continent by the abrupt change in the direction of the coast at Point Barrow, the testimony of all navigators is conclusive that it is felt, and that an easterly set pervades to a greater extent than a westerly one, and that this set is more noticeable to the east of the Mackenzie."

All the papers in the second part of the Selection, that on Ethnology, are valuable. Mr C. R. Markham contributes four papers, the first "On the Origin and Migration of the Greenland Eskimo," being one of the most interesting and instructive in the whole book. Mr. Markham has evidently given the subject careful study, and his hypotheses seem to us to be on the whole sound. For three centuries after the Norse began to settle in Greenland in the end of the tenth century, Mr. Markham believes that no indigenous race was seen in the land; that all at once, about the middle of the fourteenth century, a horde of Skrœllings appeared in the extreme northern frontier settlements of Greenland, and seem rapidly to have stamped out the Norse colonists. Whether this was so or not, there seem to us great probability in the theory of the migration of the Greenland Esquimaux advanced by Mr. Markham. During the centuries preceding the first reported appearance of the Esquimaux in Greenland, the commotions in Central Asia, under Tugrul Beg, Jenghiz Khan, and other leaders, were the means of sending forth swarms of Turks and

Mongols in all directions. The pressure caused by these invading waves on the tribes of Northern Siberia drove them still further to the north. Horde succeeding horde increased the pressure, until at last the Omoki, the Chelaki, the Onkilon, and other aboriginal tribes, were driven quite out of the country, and have long ago disappeared entirely, leaving only traditions of their existence and remains here and there of their *yourts* or dwellings.

Mr. Markham thinks that here we have probably the commencement of the exodus of the Greenland Esquimaux, which spread over a period of one or two centuries. He believes they must have made their way from Cape Chelagskoi to the Parry group, probably over a chain of islands. Still keeping northwards, by Banks Island, Melville Island, Bathurst Island, North Somerset and Devon, Jones' Sound, Carey Islands, on all which undoubted traces of Esquimaux have been found, but where the conditions are not favourable to permanent settlement, the Asiatic emigrants made their way to Smith Sound, which they crossed in parties during the fourteenth, fifteenth, and sixteenth centuries. Some established their hunting grounds between the Humboldt and Melville Bay glaciers, and became the ancestors of that very curious and interesting race of men the Arctic Highlanders. Here the vegetation, the constant open water, and other conditions rendered a permanent settlement possible. Mr. Markham believes that some of these immigrants proceeded southwards and peopled South Greenland; not only so, but that parties also wandered still further north than the Humboldt Glacier, and that it is not improbable that our new Expedition may find groups of Esquimaux up to the very Pole itself. *Nous verrons.* Meantime, we repeat, Mr. Markham's theory seems to us a plausible one, and to answer all the requirements of an immigration into Greenland of a people such as are the Esquimaux. Dr. Rink, however, in a paper on the Descent of the Esquimaux, is inclined to believe them the last wave of an aboriginal American population driven from the interior by the pressure of tribes behind them. This may have been so, and the people in the north-east of Siberia, so strongly resembling the Esquimaux in language, *physique*, and customs, may have been American emigrants; but the reverse hypothesis appears to us much more probable.

Another extremely interesting paper by Mr. Markham, on the Arctic Highlanders, contains many details concerning the country, the character, the manners, customs, language, &c., of this curious people. Mr. Markham remarks upon what has been noticed by several explorers, the wonderful talent of this people for topography, and reproduces a most careful and accurate chart of the Greenland Coast from Cape York to Smith Channel, drawn by the Greenlander Erasmus York. These two papers are well worthy the attention, not only of the explorers for whom they have been compiled, but of all interested in Greenland ethnography. Mr. Markham's other contributions are a sketch of the grammar of the Esquimaux language, with copious vocabularies, and a long list of the names of all places on the coast of Greenland from lat. 65° 15′ N. on the eastern side, round Cape Farewell, to the entrance of Smith Sound. Along with this most laborious list is a chart of the south coast of Greenland from the Danish Admiralty Survey, with Mr. R. H. Major's adaptation of the ancient sites in the East Bygd, of the old Greenland colony.

Dr. Rink's paper on the Descent of the Esquimaux we have already referred to, and we have space merely to allude to the admirable and interesting and almost exhaustive paper on the Western Esquimaux, by Dr. John Simpson, of H.M.S. *Plover*, reprinted from the Parliamentary Arctic Papers of 1855. The volume concludes with the Report of the Anthropological Institute, and an appendix containing ethnological questions for explorers, drawn up by various eminent members of that Society.

Altogether, from the brief glance we have been able to take at this "Selection," it will be seen that it contains much of really intrinsic value, for having put which into so accessible a form, all who take an interest in Arctic matters will be grateful to the Geographical Society. It will, we are sure, moreover, be a welcome addition to the equipment of the members of the Arctic Expedition; and if carefully studied, as no doubt it will be, it cannot but suggest many lines of inquiry that are likely to lead to very valuable results.

VOGEL'S "LIGHT AND PHOTOGRAPHY"

The Chemistry of Light and Photography in its Application to Art, Science, and Industry. By Dr. Hermann Vogel, Professor in the Royal Industrial Academy of Berlin. With 100 Illustrations. (London: Henry S. King and Co., 1875.)

TO one acquainted with the very small amount of scientific literature yearly produced by the professional and amateur devotees of photography the name of Dr. Hermann Vogel is one associated most intimately with the scientific progress of the art. Dr. Vogel has lately attracted somewhat wider notice by his researches on the effects of coloured media in modifying the action of monochromatic light on photographic films, and the research is likely to lead to important results in the department of spectrum photography.

It was therefore in anticipation of at last finding a scientific manual of photography that we took up the translation of Dr. Vogel's work at present under review, hoping that Messrs. King and Co. had been the means of bringing a good book before the English scientific and photographic world. Unfortunately the whole experiment has been spoiled by the simple device of placing the translation in the hands of a person who is totally unacquainted with either chemistry or photography, and who is also not given to expressing himself in clear English.

On p. 4 we are informed that argentic chloride can be prepared by "directing chloric gas upon metallic silver;" and on p. 19 that "by employing *iodide of bromium* . . . the process of exposure was made a matter of seconds." On p. 35, "Archer coated glass plates with collodion in which salts of iodide had been dissolved;" and the same page contains this typical specimen of English: "After 1853 paper pictures on collodion negatives came more and more into vogue, the demands for daguerreotypes fell off and soon vanished altogether, and were produced only here and there in America;" while on p. 36 we are told that there are in Berlin "ten photographic album manufactories, to satisfy the demand, from whence they are exported to all parts of the world."